

Abstract

The present invention relates to an injection nozzle (1) for an internal combustion engine, having a nozzle body (2) equipped with a first nozzle needle (8) that is able to control at least one first injection opening (5) and equipped with a second nozzle needle (15) that is able to control at least one second injection opening (6).

It is possible to achieve a simplified design of the injection nozzle (1) in that a first drive piston (18) is coupled to the first nozzle needle (8) and is equipped with a first booster surface (20) that a first hydraulic pressure transmission path (44) hydraulically couples to a control surface (40) of a control piston (38), a second drive piston (28) is coupled to the second nozzle needle (15) and is equipped with a second booster surface (30) that an activatable and deactivatable second hydraulic pressure transmission path (47) is able to hydraulically couple to a control surface (43) of the control piston (38); the activation and deactivation of the second hydraulic pressure transmission path (47) is controlled as a function of the control piston stroke.

(Fig. 1)

Reference Numeral List

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| 1 | injection nozzle |
| 2 | nozzle body |
| 3 | nozzle tip |
| 4 | combustion chamber/premixing chamber |
| 5 | first injection opening |
| 6 | second injection opening |
| 7 | first needle guide |
| 8 | first nozzle needle |
| 9 | first needle tip |
| 10 | first sealing seat |
| 11 | supply line |
| 12 | nozzle chamber |
| 13 | annular chamber |
| 14 | second needle guide |
| 15 | second nozzle needle |
| 16 | second needle tip |
| 17 | second sealing seat |
| 18 | first drive piston |
| 19 | washer |
| 20 | first booster surface |
| 21 | first booster chamber |
| 22 | first compensator surface |
| 23 | first compensator chamber |
| 24 | first spring |
| 25 | first pressure shoulder |
| 26 | leakage chamber |
| 27 | leakage conduit |
| 28 | second drive piston |
| 29 | dividing line |

30	second booster surface
31	second booster chamber
32	second spring
33	second pressure shoulder
34	first control conduit
35	first control chamber
36	second control conduit
37	second control chamber
38	control piston
39	push rod
40	first control surface
41	first end of 38
42	second end of 38
43	second control surface
44	first hydraulic pressure transmission path
45	inlet line
46	inlet valve
47	second hydraulic pressure transmission path
48	hydraulic connection
49	segment of 48
50	annular chamber
51	conduit
52	opening direction
53	stroke distance/switching value
54	compensator conduit
55	return spring
56	actuator piston
57	actuator
58	piston head
59	piston rod
60	second compensator surface

61	second compensator chamber
62	throttle segment
63	control piston guide
64	pins
65	throttle segment
66	piston guide
67	coupling piston
68	first end of 67
69	first coupling surface
70	second end of 67
71	second coupling surface
72	first segment of 54
73	second segment of 54
74	third segment of 54
75	annular chamber
76	annular chamber
77	throttle segment
78	control chamber
79	control surface
80	control conduit
81	hydraulic connection
82	first connecting conduit
83	second connecting conduit
84	stroke distance/switching value
85	lateral bore
86	throttle segment
87	piston guide